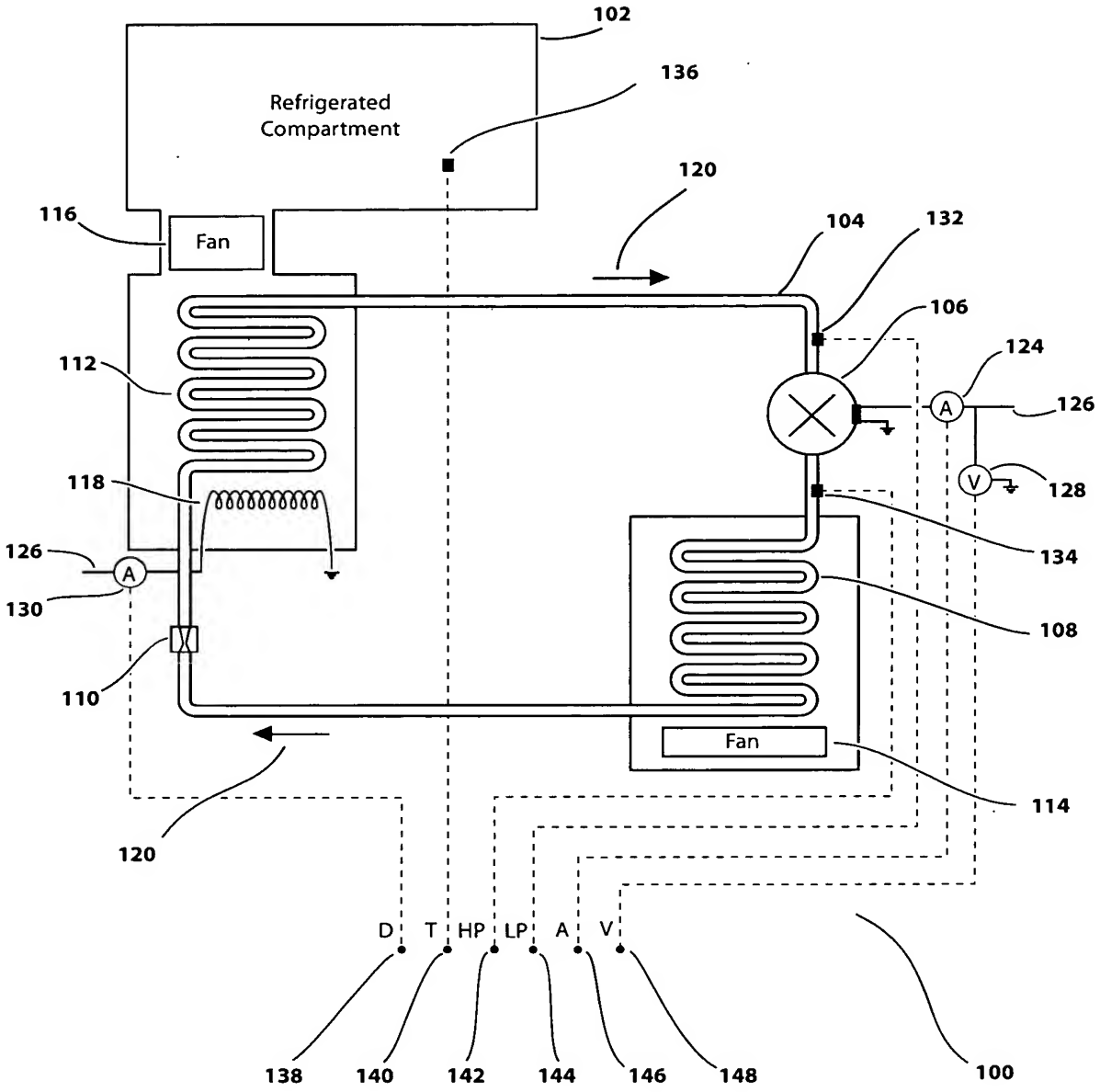
102
Refrigerated Compartment
136
120
116
Fan
104
132
106
112
124
126
A
V
128
118
134
126
A
130
108
110
Fan
114
120
D
T
HP
LP
A
V
138
140
142
144
146
148
100

Fig. 1

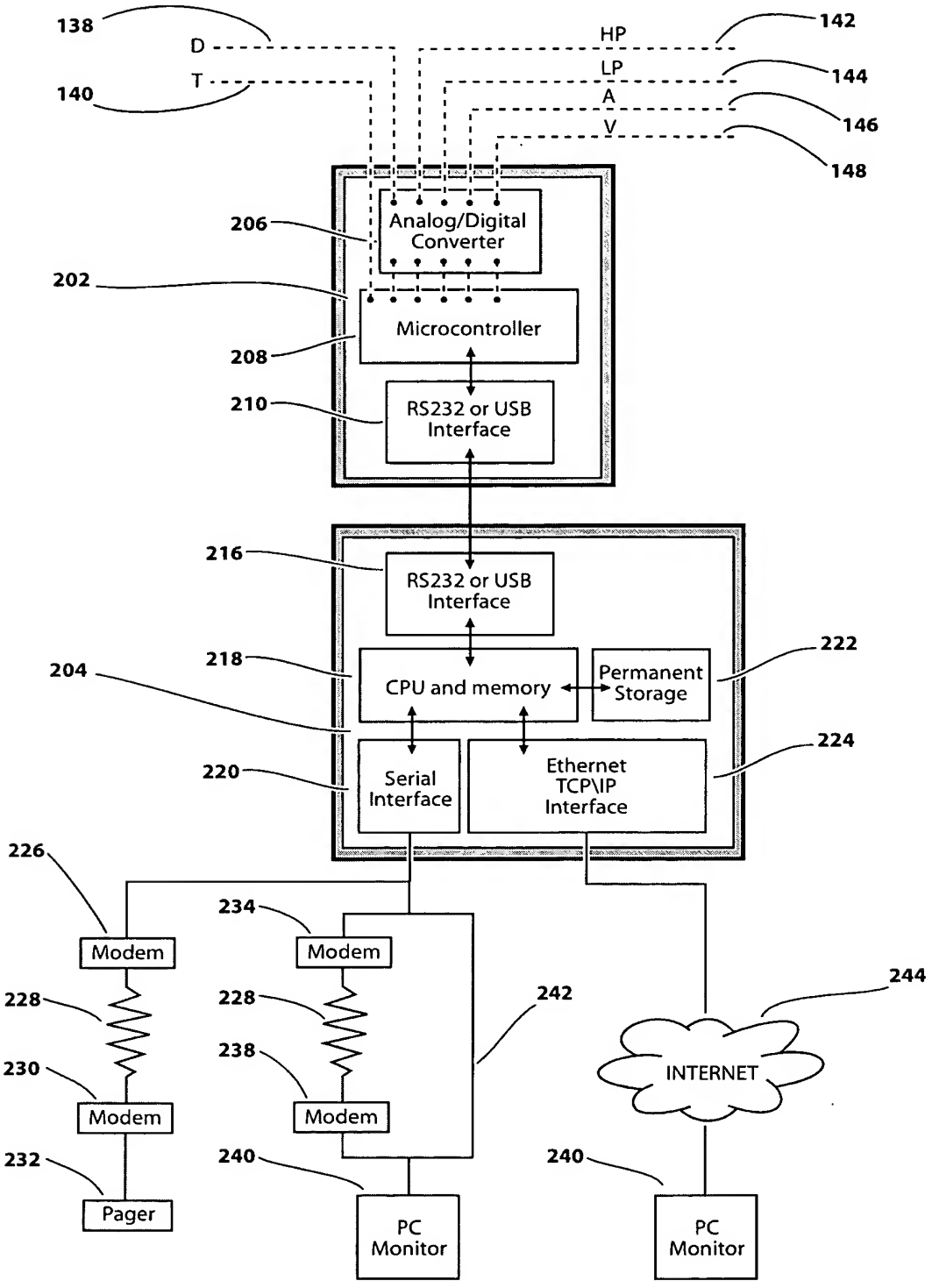
138
D
140
T
HP
142
LP
144
A
146
V
148
206
Analog/Digital Converter
202
Microcontroller
208
210
RS232 or USB Interface
216
RS232 or USB Interface
218
CPU and memory
Permanent Storage
222
204
224
220
Serial Interface
Ethernet TCP\IP Interface
226
234
Modem
Modem
228
228
242
244
230
238
INTERNET
Modem
Modem
232
240
240
Pager
PC Monitor
PC Monitor

Fig. 2

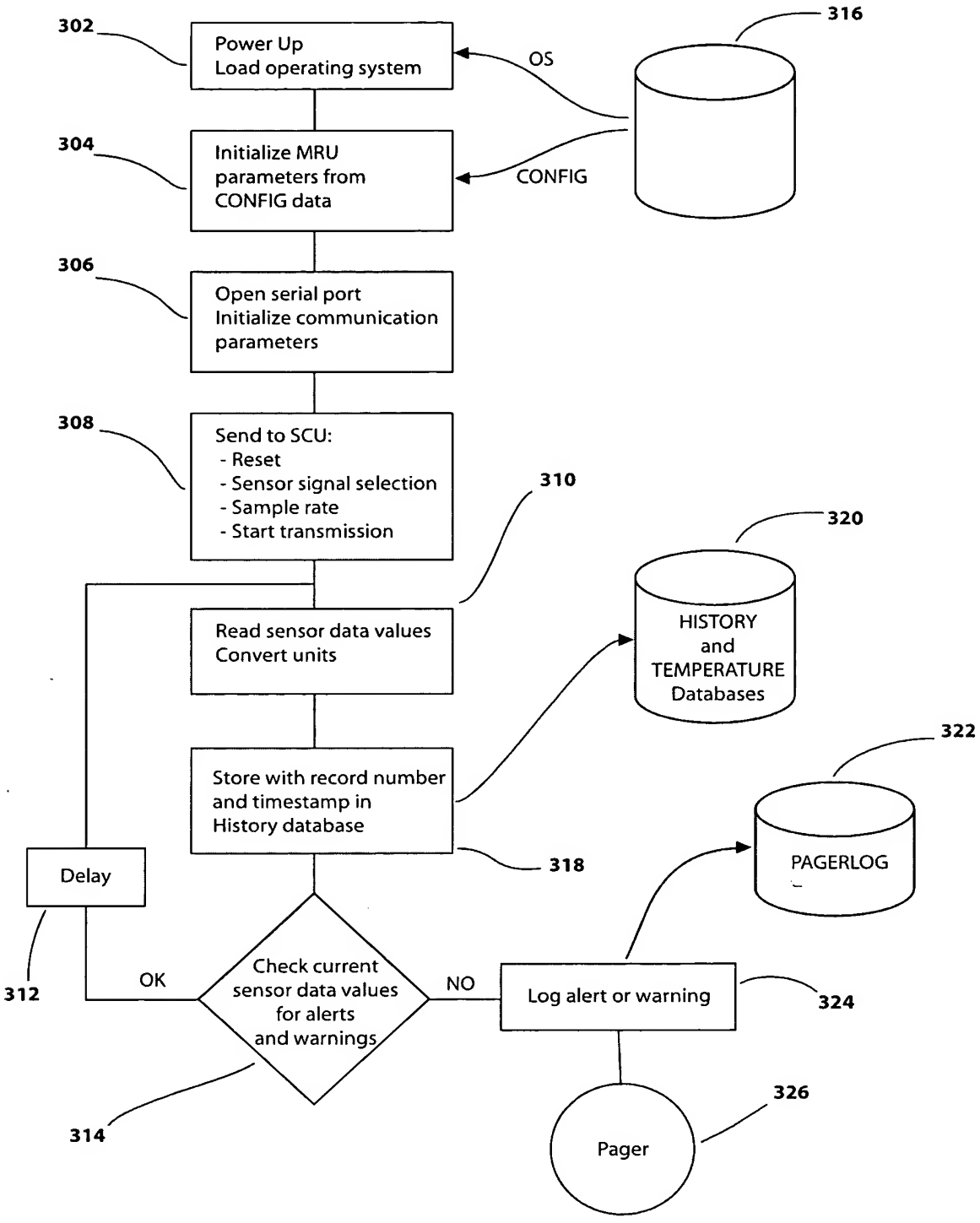
302
Power Up
Load operating system
OS
316
304
Initialize MRU
parameters from
CONFIG data
CONFIG
306
Open serial port
Initialize communication
parameters
308
Send to SCU:
- Reset
- Sensor signal selection
- Sample rate
- Start transmission
310
320
Read sensor data values
Convert units
HISTORY
and
TEMPERATURE
Databases
322
Store with record number
and timestamp in
History database
318
PAGERLOG
Delay
312
OK
Check current
sensor data values
for alerts
and warnings
NO
Log alert or warning
324
314
326
Pager

Fig. 3

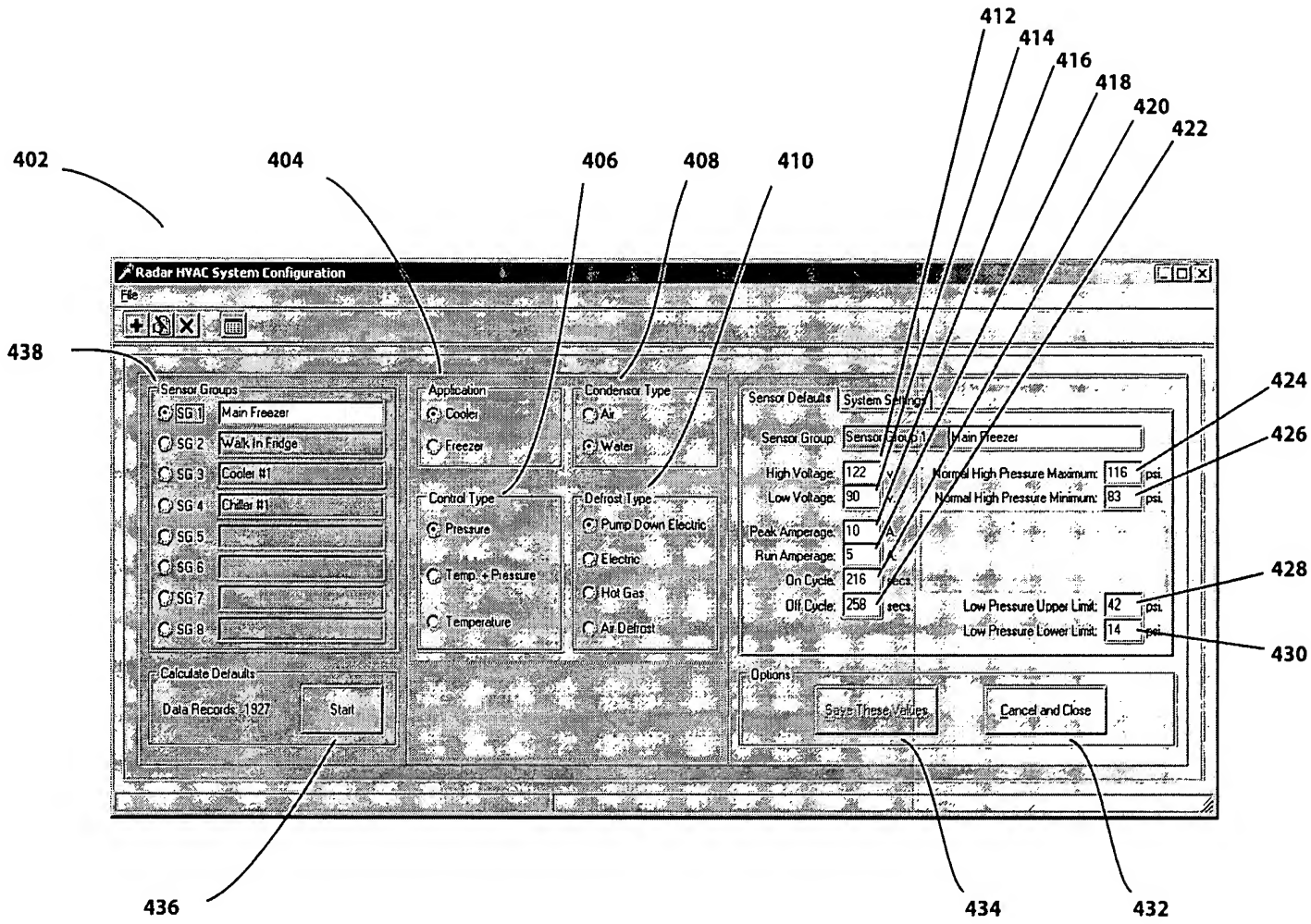
402
404
406
408
410
412
414
416
418
420
422
424
426
428
430
432
434
436
438
Radar HVAC System Configuration
File
Sensor Groups
SG 1
Main Freezer
SG 2
Walk In Fridge
SG 3
Cooler #1
SG 4
Chiller #1
SG 5
SG 6
SG 7
SG 8
Calculate Defaults
Data Records: 1927
Start
Application
Cooler
Freezer
Condensor Type
Air
Water
Control Type
Pressure
Temp. + Pressure
Temperature
Defrost Type
Pump Down Electric
Electric
Hot Gas
Air Defrost
Sensor Defaults
System Settings
Sensor Group:
Sensor Group 1
Main Freezer
High Voltage:
122
V
Low Voltage:
90
V
Peak Amperage:
10
A
Run Amperage:
5
A
On Cycle:
216
secs
Off Cycle:
258
secs
Normal High Pressure Maximum:
116
psi
Normal High Pressure Minimum:
83
psi
Low Pressure Upper Limit:
42
psi
Low Pressure Lower Limit:
14
psi
Options
Save These Values
Cancel and Close

Fig. 4

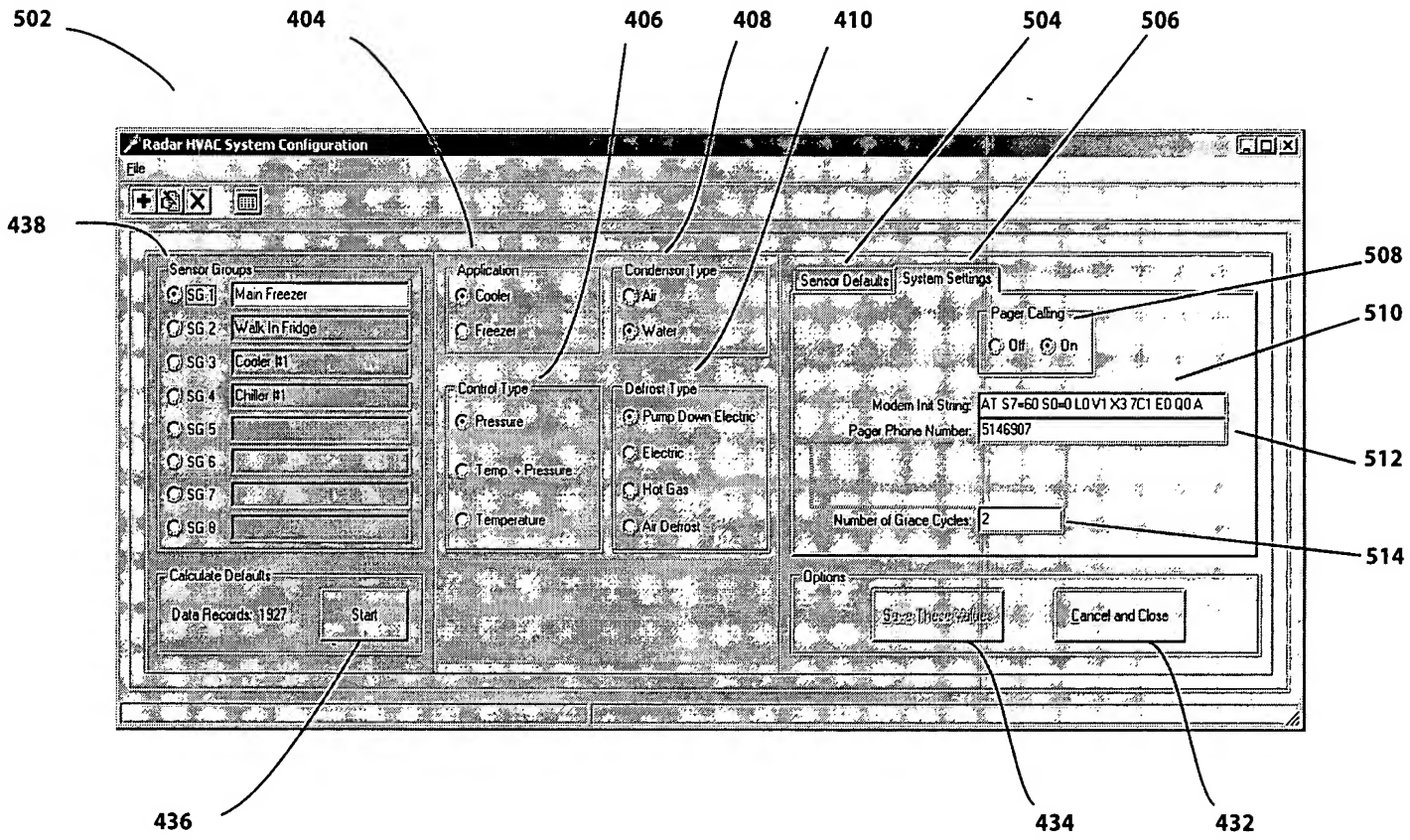
502
404
406
408
410
504
506
438
508
510
512
514
436
434
432
Radar HVAC System Configuration
File
Sensor Groups
SG 1
Main Freezer
SG 2
Walk In Fridge
SG 3
Cooler #1
SG 4
Chiller #1
SG 5
SG 6
SG 7
SG 8
Calculate Defaults
Data Records: 1927
Start
Application
Cooler
Freezer
Condensor Type
Air
Water
Control Type
Pressure
Temp. + Pressure
Temperature
Defrost Type
Pump Down Electric
Electric
Hot Gas
Air Defrost
Sensor Defaults
System Settings
Pager Calling
Off
On
Modem Init String:
AT S7=60 S0=0 L0 V1 X3 7C1 E0 Q0 A
Pager Phone Number:
5146907
Number of Grace Cycles:
2
Options
Save These Values
Cancel and Close

Fig. 5

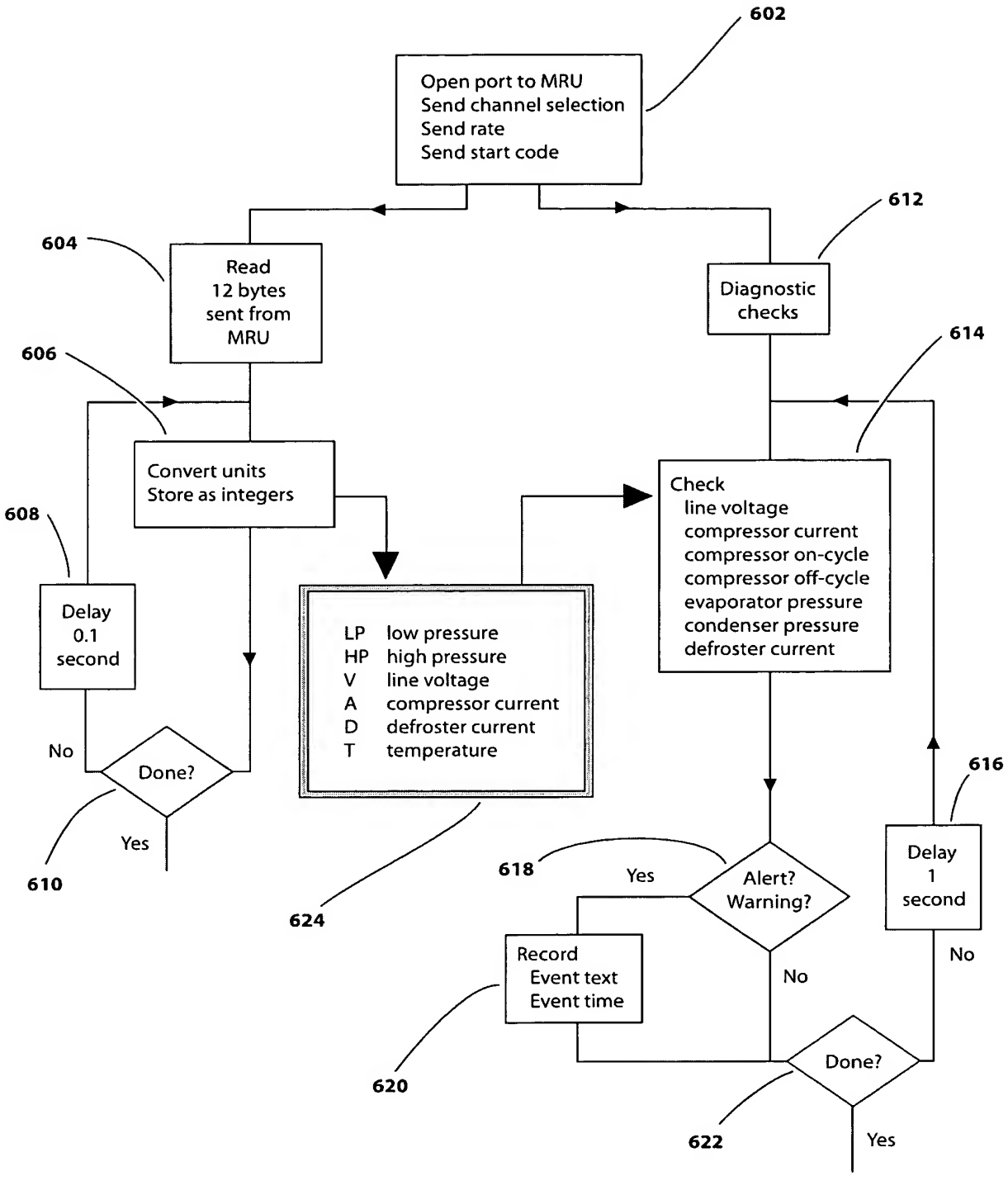
602
Open port to MRU
Send channel selection
Send rate
Send start code
604
Read
12 bytes
sent from
MRU
606
Convert units
Store as integers
608
Delay
0.1
second
No
Done?
Yes
610
LP low pressure
HP high pressure
V line voltage
A compressor current
D defroster current
T temperature
624
612
Diagnostic
checks
614
Check
line voltage
compressor current
compressor on-cycle
compressor off-cycle
evaporator pressure
condenser pressure
defroster current
616
Delay
1
second
618
Yes
Alert?
Warning?
No
Record
Event text
Event time
620
Done?
622
Yes
No

Fig. 6

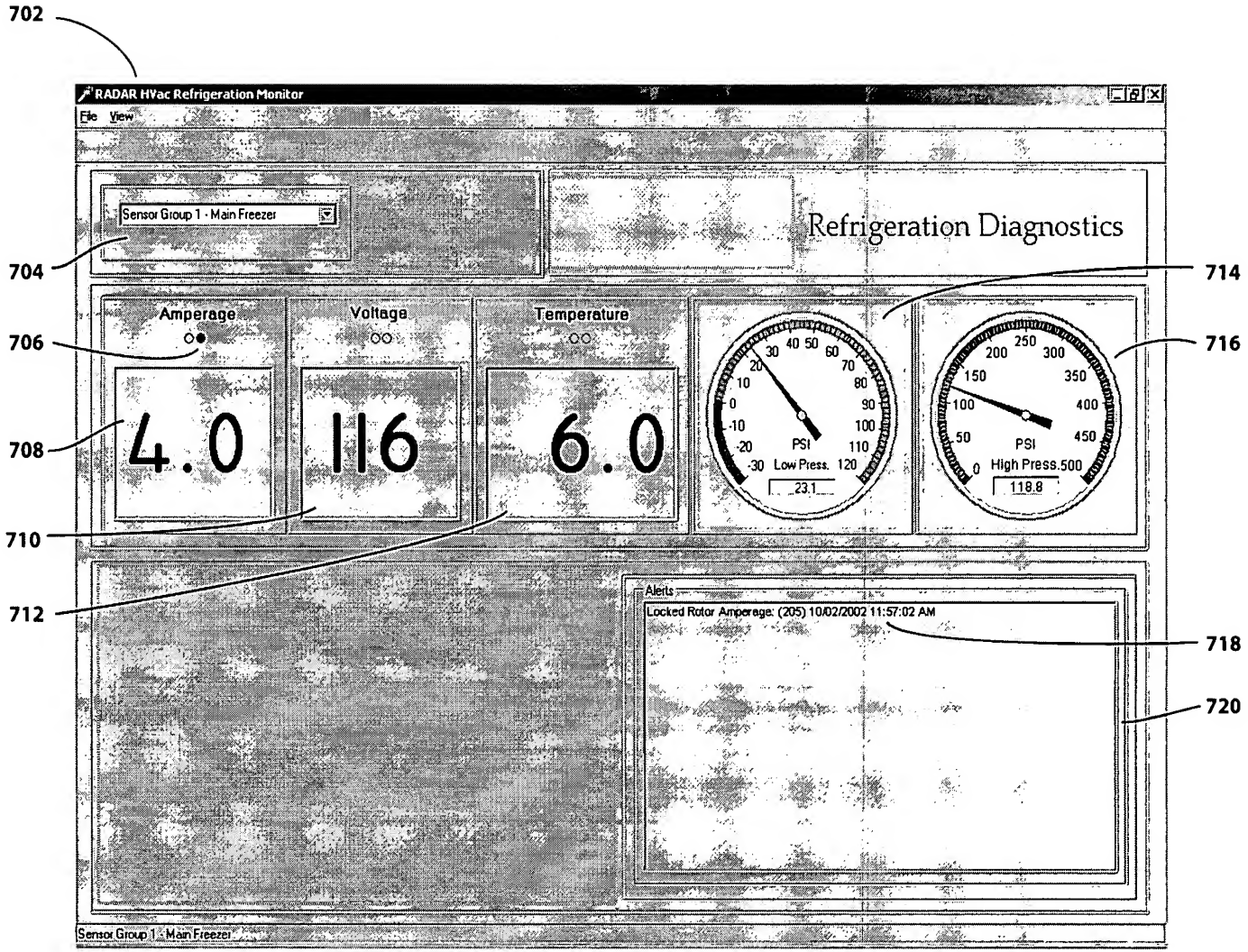
702
RADAR HVac Refrigeration Monitor
File View
Sensor Group 1 - Main Freezer
Refrigeration Diagnostics
704
714
Amperage
Voltage
Temperature
706
716
4.0
116
6.0
708
PSI
Low Press. 120
23.1
PSI
High Press.500
118.8
710
712
Alerts
Locked Rotor Amperage: (205) 10/02/2002 11:57:02 AM
718
720
Sensor Group 1 - Main Freezer

Fig. 7

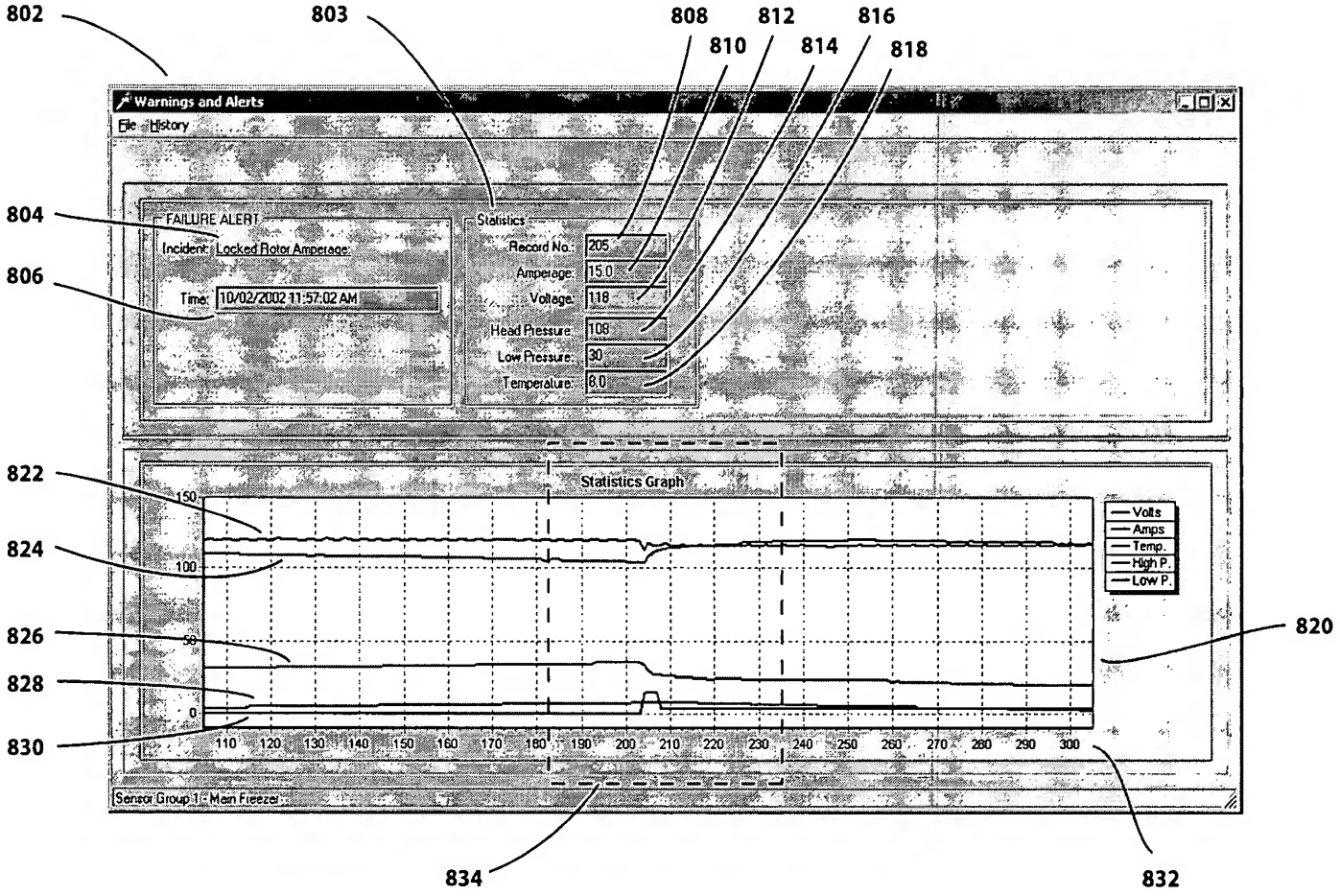
802
803
808
812
816
810
814
818
804
806
822
824
826
828
830
820
834
832
Warnings and Alerts
File History
FAILURE ALERT
Incident: Locked Rotor Amperage
Time: 10/02/2002 11:57:02 AM
Statistics
Record No.: 205
Amperage: 15.0
Voltage: 118
Head Pressure: 108
Low Pressure: 30
Temperature: 8.0
Statistics Graph
150
100
50
0
110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300
Volts
Amps
Temp.
High P.
Low P.
Sensor Group 1 - Main Freezer

Fig 8

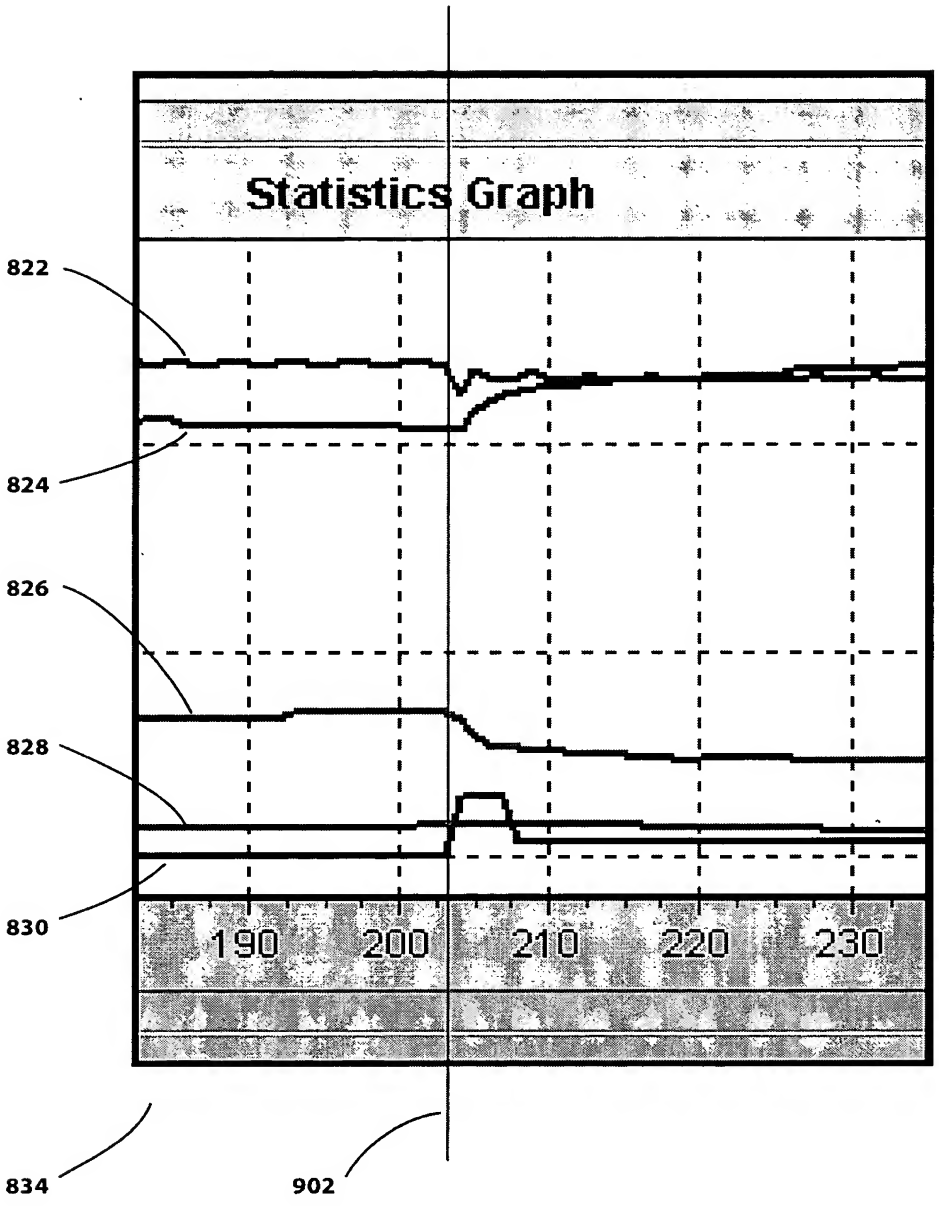
Statistics Graph
822
824
826
828
830
190
200
210
220
230
834
902

Fig. 9

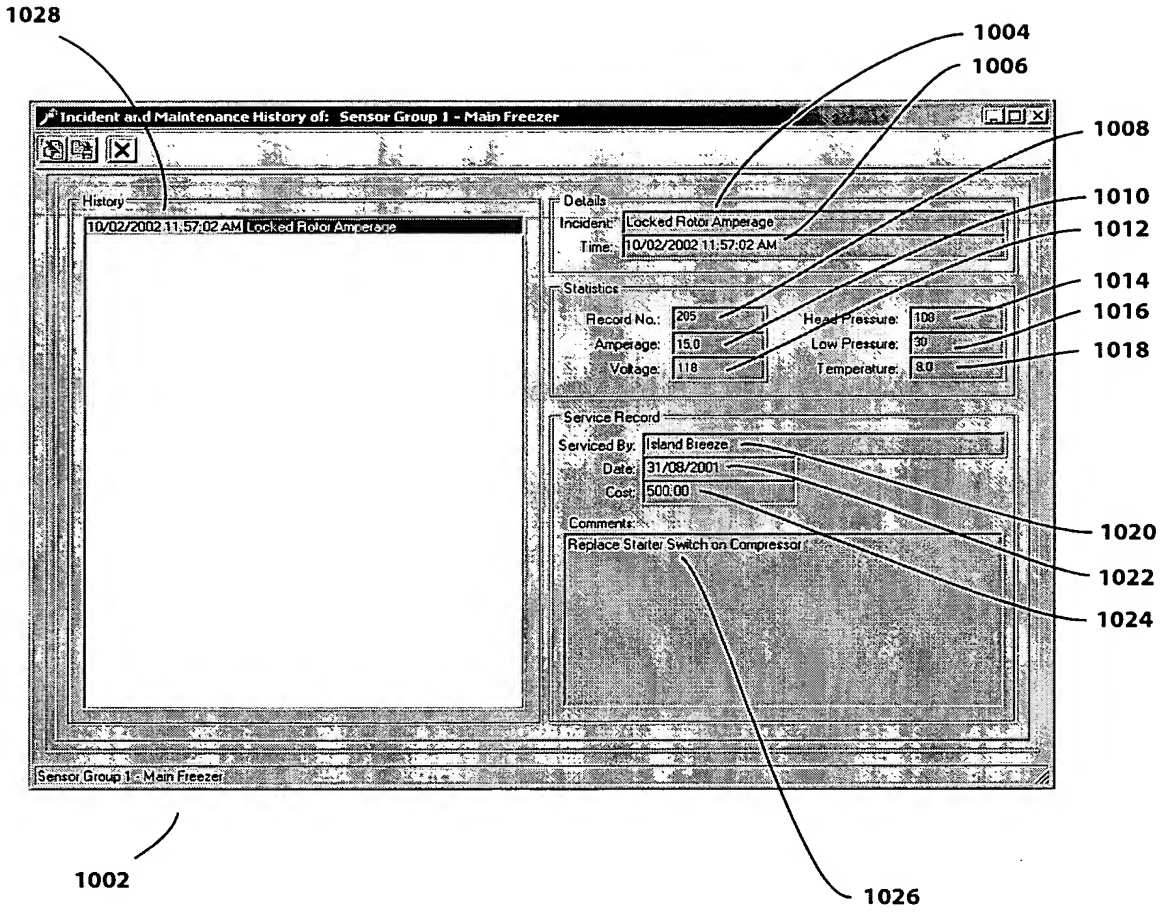
1028
1004
1006
1008
1010
1012
1014
1016
1018
1020
1022
1024
1026
1002
Incident and Maintenance History of: Sensor Group 1 - Main Freezer
History
10/02/2002 11:57:02 AM Locked Rotor Amperage
Details
Incident: Locked Rotor Amperage
Time: 10/02/2002 11:57:02 AM
Statistics
Record No.: 205
Amperage: 15.0
Voltage: 118
Head Pressure: 100
Low Pressure: 30
Temperature: 8.0
Service Record
Serviced By: Island Breeze
Date: 31/08/2001
Cost: 500.00
Comments:
Replace Starter Switch on Compressor
Sensor Group 1 - Main Freezer

Fig. 10

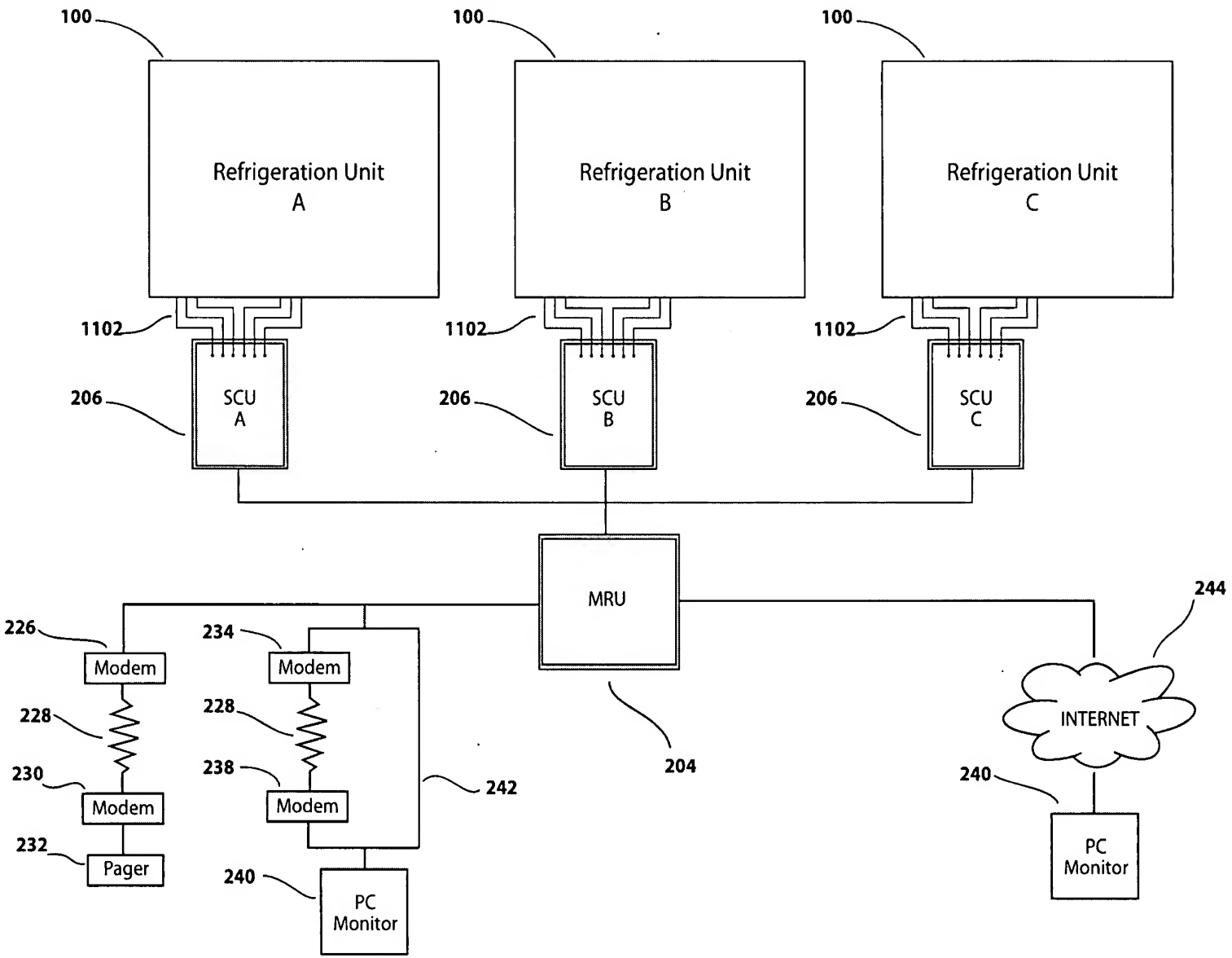
100
100
100
Refrigeration Unit A
Refrigeration Unit B
Refrigeration Unit C
1102
1102
1102
206
206
206
SCU A
SCU B
SCU C
MRU
204
244
INTERNET
240
PC Monitor
226
234
Modem
Modem
228
228
230
238
Modem
Modem
232
Pager
242
240
PC Monitor

Fig. 11

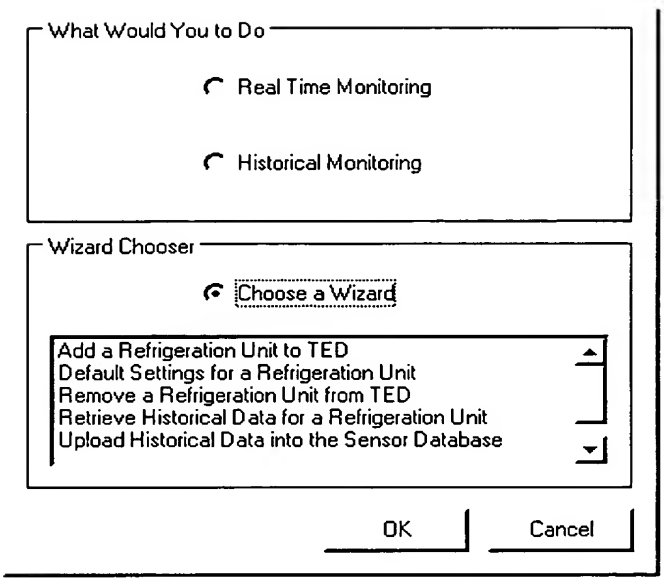
What Would You to Do
Real Time Monitoring
Historical Monitoring
Wizard Chooser
Choose a Wizard
Add a Refrigeration Unit to TED
Default Settings for a Refrigeration Unit
Remove a Refrigeration Unit from TED
Retrieve Historical Data for a Refrigeration Unit
Upload Historical Data into the Sensor Database
OK
Cancel

Fig. 12

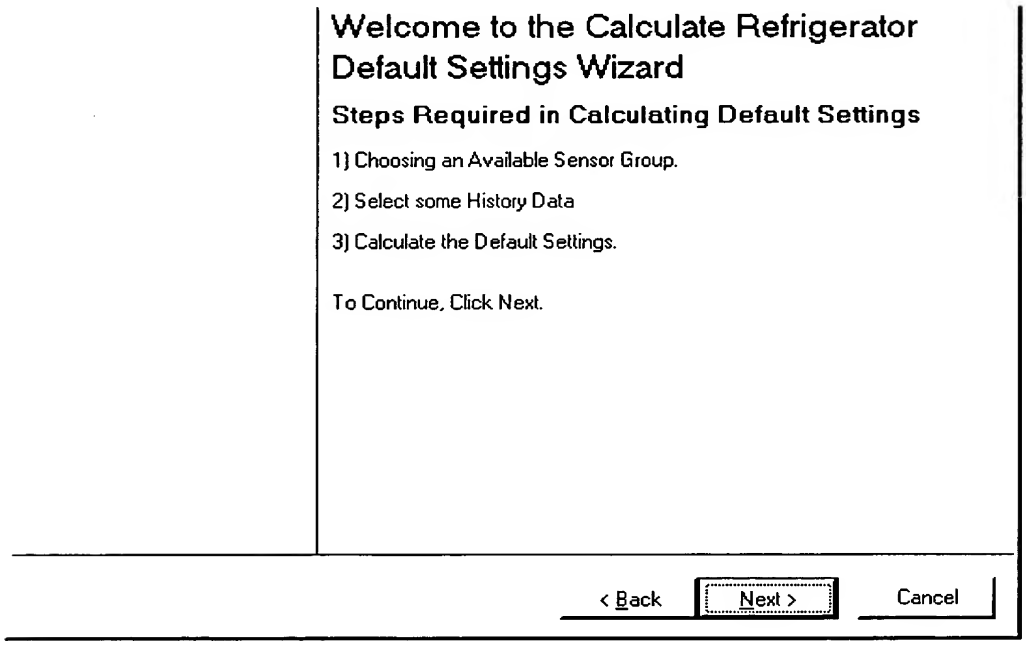
Welcome to the Calculate Refrigerator Default Settings Wizard
Steps Required in Calculating Default Settings
1) Choosing an Available Sensor Group.
2) Select some History Data
3) Calculate the Default Settings.
To Continue, Click Next.
< Back
Next >
Cancel

Fig. 13

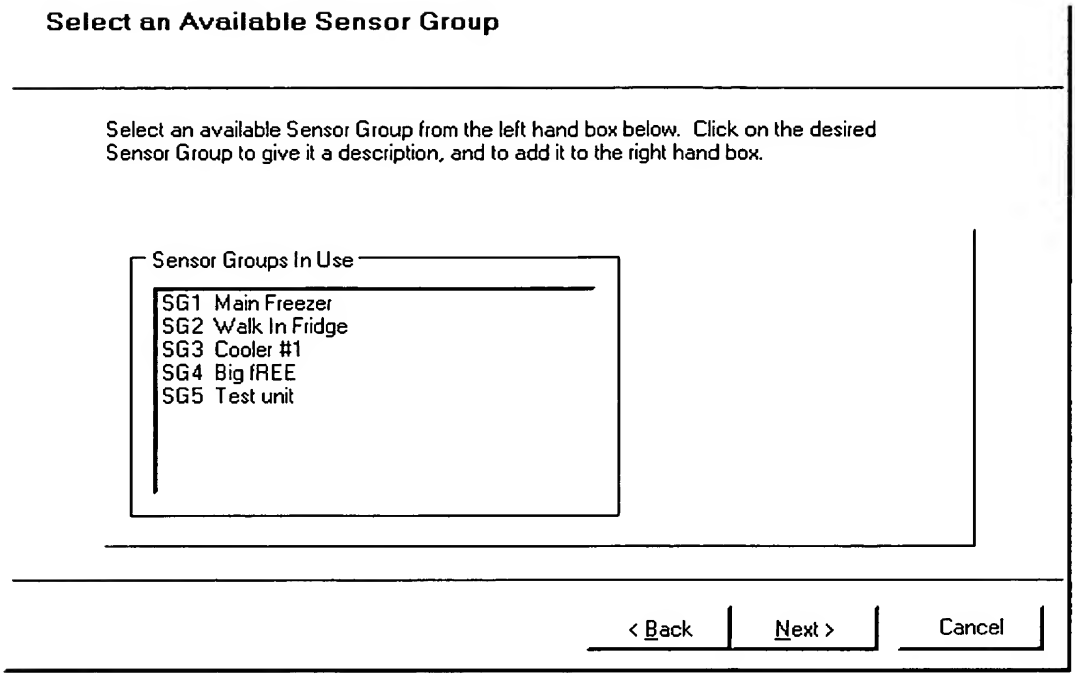
Select an Available Sensor Group
Select an available Sensor Group from the left hand box below. Click on the desired Sensor Group to give it a description, and to add it to the right hand box.
Sensor Groups In Use
SG1 Main Freezer
SG2 Walk In Fridge
SG3 Cooler #1
SG4 Big fREE
SG5 Test unit
< Back
Next >
Cancel

Fig. 14

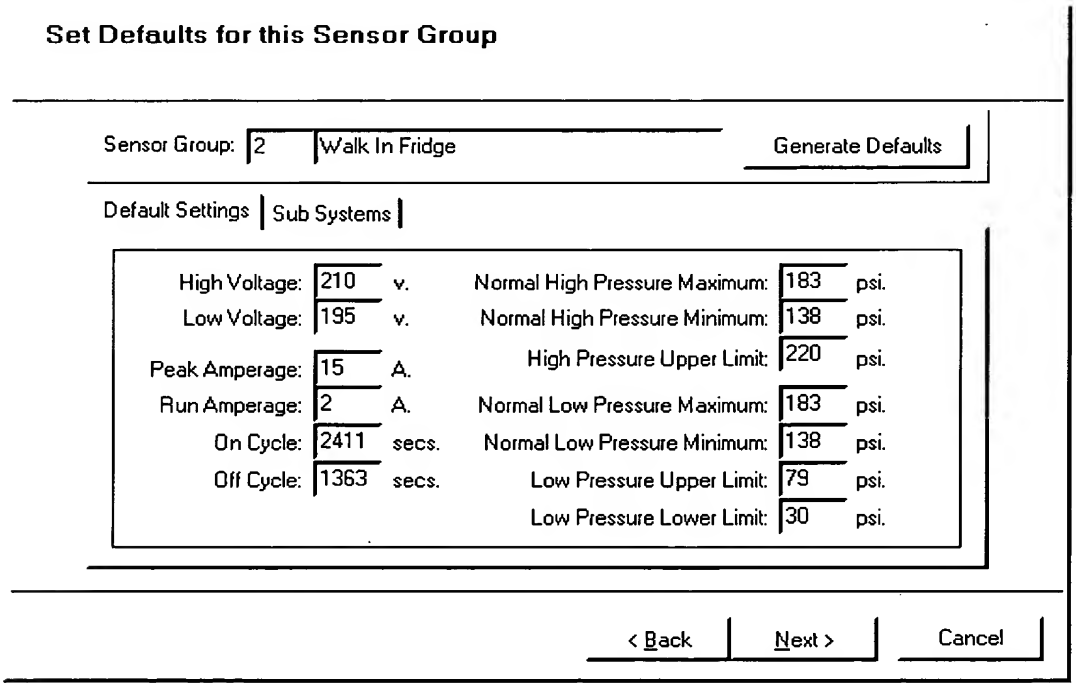
Set Defaults for this Sensor Group
Sensor Group: 2 Walk In Fridge
Generate Defaults
Default Settings
Sub Systems
High Voltage: 210 v.
Low Voltage: 195 v.
Peak Amperage: 15 A.
Run Amperage: 2 A.
On Cycle: 2411 secs.
Off Cycle: 1363 secs.
Normal High Pressure Maximum: 183 psi.
Normal High Pressure Minimum: 138 psi.
High Pressure Upper Limit: 220 psi.
Normal Low Pressure Maximum: 183 psi.
Normal Low Pressure Minimum: 138 psi.
Low Pressure Upper Limit: 79 psi.
Low Pressure Lower Limit: 30 psi.
< Back
Next >
Cancel

Fig. 15

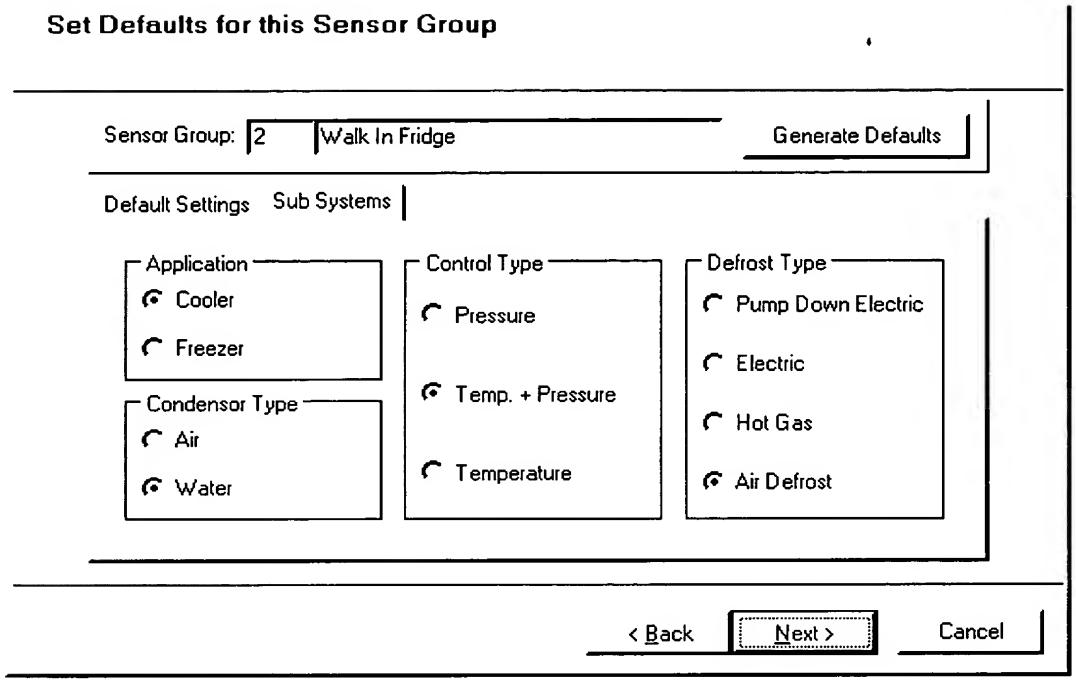
Set Defaults for this Sensor Group
Sensor Group: 2 Walk In Fridge
Generate Defaults
Default Settings
Sub Systems
Application
Cooler
Freezer
Condensor Type
Air
Water
Control Type
Pressure
Temp. + Pressure
Temperature
Defrost Type
Pump Down Electric
Electric
Hot Gas
Air Defrost
< Back
Next >
Cancel

Fig. 16

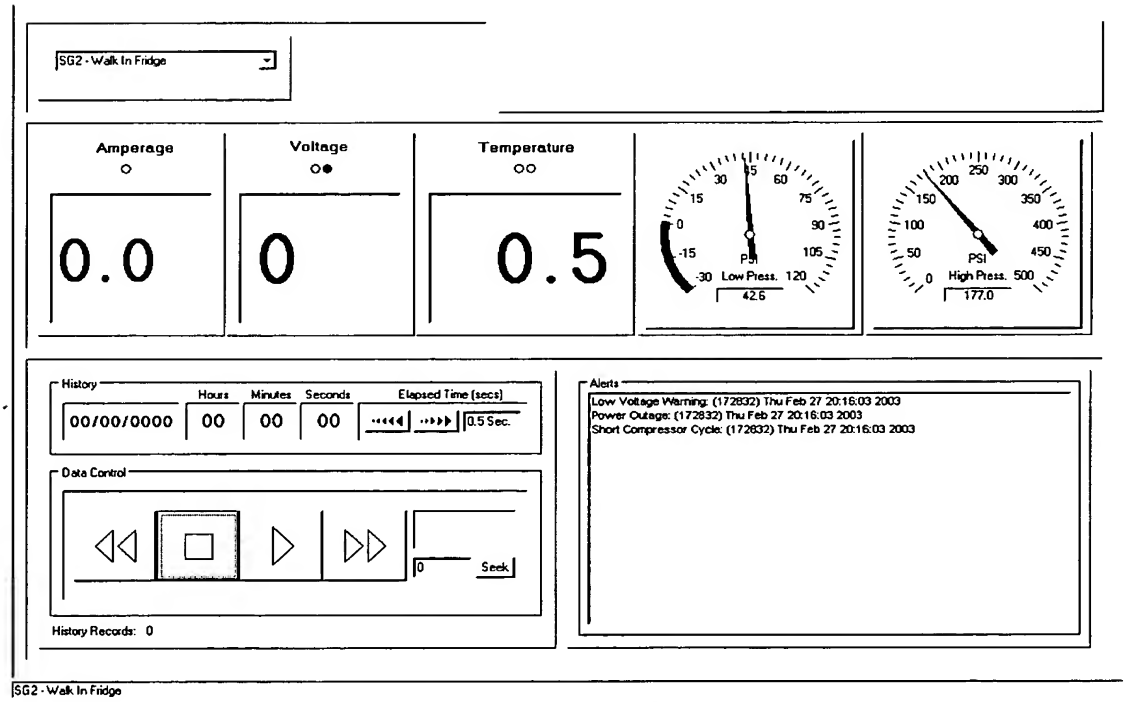
SG2 - Walk In Fridge
Amperage
Voltage
Temperature
0.0
0
0.5
Low Press.
High Press.
PSI
History
Hours
Minutes
Seconds
Elapsed Time (secs)
00/00/0000
00
00
00
0.5 Sec.
Data Control
Seek
History Records: 0
Alerts
Low Voltage Warning: (172832) Thu Feb 27 20:16:03 2003
Power Outage: (172832) Thu Feb 27 20:16:03 2003
Short Compressor Cycle: (172832) Thu Feb 27 20:16:03 2003
SG2 - Walk In Fridge

Fig. 17

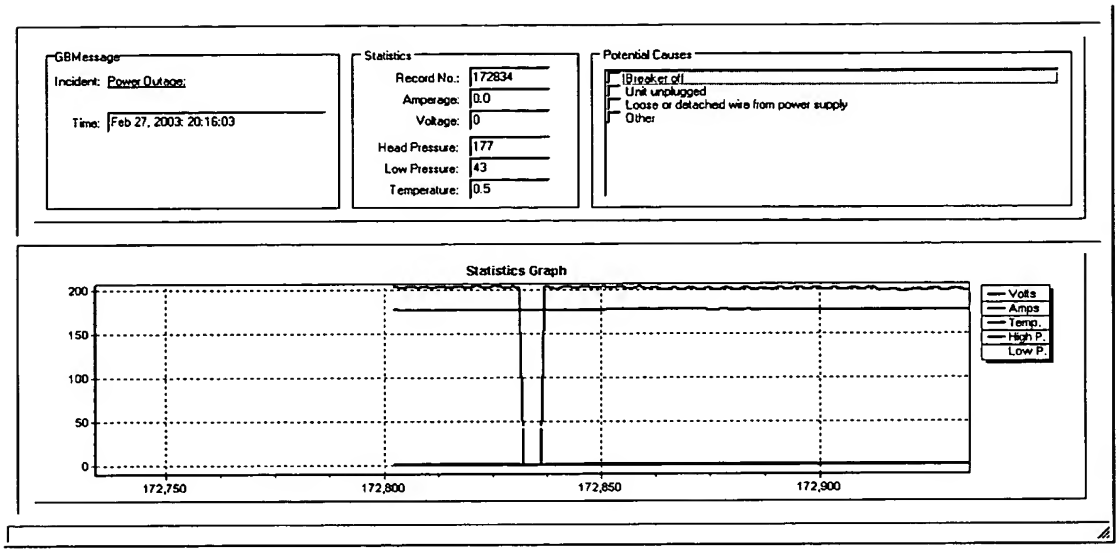
GBMessage
Incident: Power Outage:
Time: Feb 27, 2003: 20:16:03
Statistics
Record No.: 172834
Amperage: 0.0
Voltage: 0
Head Pressure: 177
Low Pressure: 43
Temperature: 0.5
Potential Causes
Breaker off
Unit unplugged
Loose or detached wire from power supply
Other
Statistics Graph
200
150
100
50
0
172,750
172,800
172,850
172,900
Volts
Amps
Temp.
High P.
Low P.

Fig. 18

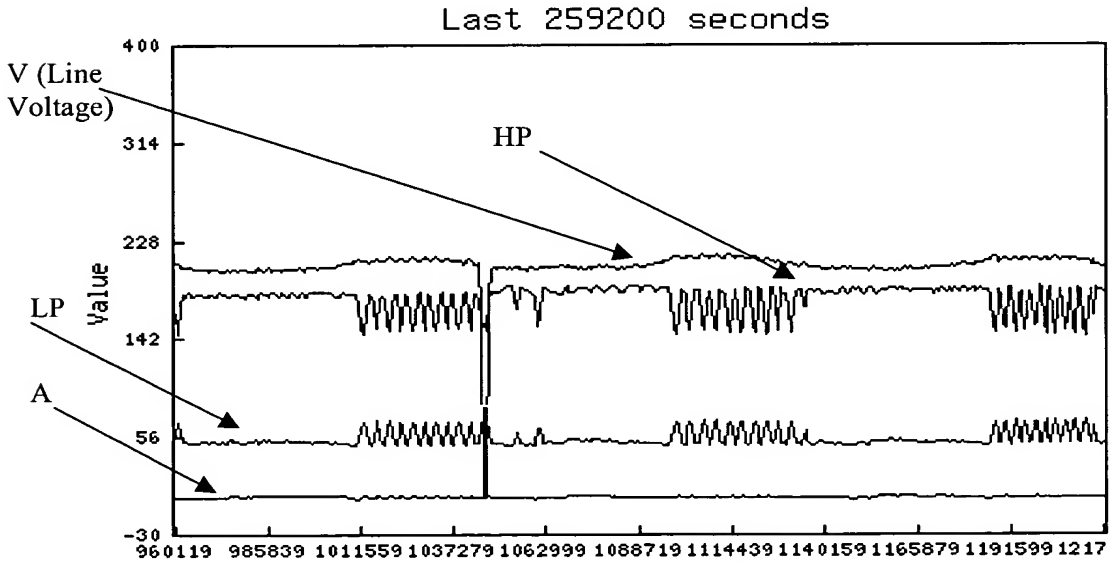
Last 259200 seconds
V (Line Voltage)
HP
LP
A
Value
400
314
228
142
56
-30
960119
985839
1011559
1037279
1062999
1088719
1114439
1140159
1165879
1191599
1217

Fig.19